

DETAILED ACTION

Response to Amendment

1. This office action is in response to the amendment filed on 7/8/09. Claims 1-117, 119, 122, and 124-130 are pending.

Claim Rejections - 35 USC § 112, First paragraph

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-112, 114-117, 119, 122, and 124-130 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Re claims 1, 29, 57 and 85, it recites “said information is transmitted from said candidate node along a first physical path, identifying said first physical path as an alternate physical path for said virtual path”. The original specification, specially page 12, fails to describe the above claim limitation.

Claims 2-28, 30-56, 58-84, 86-112, 114-117, 119, 122 and 124-130 depend on claims 1, 29, 57 and 85 are therefore similarly rejected.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 29-31, 57-59, 85-87, 114-117, 119, 124 and 127-130 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bentall et al (US 6282170, "Bentall) in view of Donahue et al (US 20020118638, "Donahue").

Re claims 1, 29, 57, and 85, Bentall discloses restoring traffic on alternate virtual path in an optical network (*restoring a virtual path using an alternate physical path*, column 6, lines 35-36). Bentall discloses determining spare capacity of each link of alternate routes (*identifying a plurality of nodes with resources, wherein nodes with resources are ones of said nodes having a resource necessary to support virtual path*, figure 4, element 113). Bentall discloses selecting alternate routes after determining spare capacity on each route (*identifying an alternate path in response to said identifying said plurality of nodes with resources, said alternate path comprising ones of said nodes with resources*, column 6, lines 1-6). Bentall fails to disclose a candidate node determining if it has sufficient resources to support a virtual path and receiving information indicating it has sufficient resources to support a virtual path. Donahue

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discloses identifying a plurality of nodes with resources necessary to support virtual path by identifying a physical path via RSVP (paragraphs [0013] and [0014]). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Bentall with the teaching of Donahue for the benefit of providing guaranteed bandwidth for maintaining a given QoS service .

Re claims 2, 30, 58, and 86, Bentall discloses restoring a virtual path using an alternate physical path (figure 4, element 114).

Re claims 3, 31, 59, 87, 124 and 127-130, Bentall discloses determining spare capacity of each link of alternate routes determining if the candidate node has sufficient resources to support the virtual path, figure 4, element 113), configuring an alternate physical path by establishing a communication connection between nodes with resources (figure 3, element 102, identifying said alternate physical path based on a list of allocated ports in said resource response packet) and provisioning virtual path over the alternate physical path (figure 4, element 114).

Re claims 114 and 115, Bentall discloses determining spare capacity of each link of alternate routes (*determining whether a node under consideration would be appropriate for use in restoring said virtual path*, figure 4, element 113).

Re claim 116, Bentall inherently discloses finding an alternate path connecting nodes with ports to support additional data traffic.

Re claim 117, Bentall discloses allowing various levels of quality of service within network (column 17, line 65 to column 18, line 5).

Re claim 119, Bentall inherently discloses rejecting a candidate node if the candidate node does not have sufficient resources to support a virtual path in selecting an alternate path (figure 4, element 113).

Claims 4-7, 14, 16, 32-35, 42, 44, 60-63, 70, 72, 88-91, 98 and 100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bentall in view of Donahue and further in view of Finn et al (U.S 6728205), hereinafter referred to as Finn.

Re claims 4, 32, 60 and 88, Bentall discloses detecting a failure in a virtual path by receiving a failure message packet (column 7, lines 29-31) and restoring a virtual path using an alternate physical path (figure 4). Bentall fails to disclose provisioning a virtual path on a physical path between a first and a second node of an optical network wherein each one of nodes is coupled to at least one another of nodes by a plurality of optical links. Finn discloses network nodes connected through fiber optic cables and re-routing messages through a secondary path in case a primary path fails (column 16, lines 1-8). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the network of Bentall to be utilized in optical network of Finn as suggested by Bentall (column 6, lines 35-36). The motivation is to get the benefit of high-speed network communications through fiber optic cables so that a prompt restoration is achieved through high-speed fiber optic communications.

Re claims 5, 6, 33, 34, 61, 62, 89 and 90, Bentall discloses all of the limitation of the base claim, but fails to disclose restoring a virtual path less than 2 seconds or 250 milliseconds. Finn discloses restoration time being about 50 milliseconds. It would have

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been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Bentall to be recovered less than 200 milliseconds by employing the concept of automatic protection switching in an optical network of Finn. The motivation is to provide fast restoration scheme and time so that switching to an alternate virtual path is transparent.

Re claims 7, 35, 63 and 91, Bentall discloses detecting a failure in a virtual path by receiving a failure message packet (column 7, lines 29-31).

Re claims 14, 16, 42, 44, 70, 72, 98 and 100, Bentall discloses intermediate nodes receiving a failure message (column 7, lines 33-35).

Claims 17, 45, 73 and 101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bentall and Donahue in view of Finn and further in view of Azuma et al (U.S 6430150), hereinafter referred to as Azuma.

Re claims 17, 45, 73 and 101, Bentall discloses all of the limitations of the base claim, but fails to disclose acknowledging a failure message and changing a state of the virtual path to down and releasing resources of the virtual path. Azuma discloses acknowledging a failure message and changing a state of the virtual path to down and releasing resources of the virtual path (column 6, lines 41-51; column 8, lines 15-18). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the network of Bentall by adding to it the process of Azuma so that unused resources would be relocated to alternate nodes for providing an alternate route.

Claim 125 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bentall in view of Donahue and further in view of Kawamura et al (US 5130974), hereinafter referred to as Kawamura..

Re claim 125, Bentall discloses detecting a failure in a virtual path, but fails to disclose forwarding a resource request to an adjacent node and waiting for a predefined time for a response to the resource request. Kawamura discloses establishing a new route to an adjacent node after receiving a grant signal in response to receipt of a request signal from an adjacent node indicating that the request is granted if an alternate route is available (column 2, lines 1-7). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Bentall with the teaching of Kawamura to implement the process of checking capacity of link at each node by transmitting request message so that a given virtual path would be re-established through an alternate route with sufficient bandwidth.

Claim 126 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bentall in view of Donahue and Kawamura and further in view of Paulish et al (US 4287592), hereinafter referred to as Paulish.

Re claim 126, Bentall discloses detecting a failure in a virtual path, but fails to disclose forwarding a resource request to an adjacent node and if the response to the resource request is not received within a predefined time, initiating a subsequent failure measure. Kawamura discloses establishing a new route to an adjacent node after receiving a grant signal in response to receipt of a request signal from an adjacent node

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indicating that the request is granted if an alternate route is available (column 2, lines 1-7). Paulish discloses checking if an acknowledgment packet is received within a predetermined time (column 27, lines 8-11). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Bentall with the teaching of Kawamura and Paulish to implement the process of checking capacity of link at each node by transmitting request message so that a given virtual path would be re-established through an alternate route with sufficient bandwidth.

Allowable Subject Matter

6. Claim 113 is allowed.
7. Claims 8-13, 15, 18-28, 36-41, 43, 46-56, 64-69, 71, 74-84, 92-97, 99, 102-112 and 122 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and rewritten to overcome the rejection(s) under 35 U.S.C. 112, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments filed on 7/8/09 have been fully considered but they are not persuasive.

The applicant argues that the cited portions of the references, whether taken individually or in combination, fails to disclose receiving information indicating that a

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candidate node has sufficient resources available to support a virtual path from the candidate node along a first physical path and the first physical path is identified as an alternate physical path for the virtual path. The examiner respectfully disagrees. Bentall discloses selecting alternate routes after determining spare capacity on each route (*identifying an alternate path in response to said identifying said plurality of nodes with resources, said alternate path comprising ones of said nodes with resources*, column 6, lines 1-6) and Donahue discloses determining if a given node has sufficient resource to support a virtual path and receiving information indicating it has sufficient resource to support a virtual path. Donahue discloses identifying a plurality of nodes with resources necessary to support virtual path by identifying a physical path via RSVP (paragraphs [0013] and [0014]). In this case, it is the combined teaching of the two references that shows all the limitations of the claim.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hong Cho whose telephone number is 571-272-3087.

The examiner can normally be reached on Mon-Fri during 7 am to 4 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pankaj Kumar can be reached on 571-272-3011. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Hong Cho/
Primary Examiner, Art Unit 2467